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John P. Musone  
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EXAMINER
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MALEKZADEH, SEYED MASOUD

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1791

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## **DETAILED ACTION**

### ***Advisory Action***

The proposed amendments filed on 09/03/2008 after a final rejection mailed on 07/09/2008 will not be entered because the amendments to the claims raise new issues that would require further consideration.

Specifically, amendments to the independent claim 11 added new limitations which require further search; amendments such as “the substrate comprising at least one **structure defect**” in lines 4-5 and “at least one **structure defect** of the substrate” in lines 9-10.

The above amendments have incorporated new terminology and features which previously have not been defined in the process for producing single-crystal structures from metallic super-alloys. Therefore, reconsideration of the prior arts of record, as well as, possible consideration of the other prior arts would be necessary to determine if the new claim limitations were not taught or suggested by the prior arts.

### ***Response to Arguments***

The applicant's arguments in regard to claims 11-16 and 18-26 filed with the amendments have been considered, but not found persuasive. The arguments relating to the structure of the substrate in the process of producing single-crystal structures from metallic super-

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alloys according to the proposed amendments are moot, as the amendments will not be entered.

Applicants argue "to provide the non single-crystal or non-directional intermediate layer of Kear into the structure of Kurz would change the principle of operation of, since the whole purpose of Kurz is to maintain the same crystal structure throughout." (See remarks; page 6, lines 2-5)

However, this is not found persuasive, as cited in the previous office action, Kurz ('792) teaches a process for producing a single crystal structure from metallic super alloys wherein one or more layers or a body or a work-piece grow, epitaxially, over the substrate. One of the middle layers is considered as an intermediate layer in which the other single crystal layers are grown epitaxially over the intermediate layer to build up a plurality of single crystalline layers over the surface of the considered intermediate layer.

Moreover, Kear et al. ('229) disclose a method for brazing and bonding two metal work-pieces wherein the process includes the step of providing an interlayer for brazing and diffusion bonding of the work-pieces wherein the interlayer foil includes an amorphous metal structure and produces an improved brazed or diffusion bonded structure between the work pieces (See abstract and lines 29-36, column 3) Also, Kear et al. ('229) teach the usefulness of the process for the joining of the cast single crystal superalloys; In such a way that the crystal structure of the

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workpieces are aligned and the amorphous interlayer is interposed and the diffusion bonding process is carried out. Furthermore, it will be found that a single crystal joined assembly will be the result from the epitaxial solidification. (See lines 65-68, column 9 and lines 1-10, column 10)

Therefore, the teachings Kurz ('792) and Kear et al. ('229) are within the same technology because both provide a method of producing a single-crystalline component structure from metallic super-alloys through epitaxial growth of the layers, therefore, the combination of Kurz et al ('792) and Kear et al ('229) references is proper; and further since Kear et al ('229) provide the advantages of applying an interlayer with an amorphous structure within joint surfaces of the single crystalline workpieces (See lines 25-36, column 3); in result, Kear et al ('229) teach a strong motivation for modifying the process of Kurz et al. ('792) through providing a non single-crystal or non-directional structure intermediate layer.

In respect to the claims 22-24, applicants argue "the vane (4) substrate of Esch is actually the equiaxed cast or wrought alloy, not the single crystal material. Thus what Esch teaches is simply an amorphous cast or wrought alloy (4) joined by a weld or braze (7) to a single crystal material (3). This structure teaches away from the structure of claims 22-24 which requires two single crystal materials joined by an intermediate layer." (See remarks, lines 13-17, and page 6)

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However, this is not found persuasive because applicants attention is drawn to the point that Esch et al. ('361) has not been used alone, but it is a combination rejection made over Esch et al. ('361) in view of Kear et al. ('229). Esch et al ('361) in view of Kear et al ('229) clearly teaches all the process limitations of claims 22-24. Furthermore, in response to the applicant's argument, claim 22 recites "a substrate having **at least partially** single-crystal structures". Also Esch et al. ('361) teach "a method for repairing a component, comprising the steps of providing a component composed of equiaxed cast or wrought alloys, removing at least one section of the component, providing at least one new composed of directionally solidified or single crystal and joining the at least one new section to the component. Where the component is a gas turbine vane, at least one section comprises leading and trailing edge sections of the gas turbine vane with respect to a direction of gas there-through in which, the directionally solidified or single crystal material in the leading and trailing edge sections preferably have a grain orientation normal to the direction of the gas." (See lines 13-25, column 2) Therefore, Esch et al. ('361) teach the leading and trailing edge sections of vane have a single crystal structure and so substrate has a partially single-crystal structure.

Therefore, the rejection of claims 22-24 are maintained.

### ***Conclusion***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Masoud Malekzadeh whose telephone number is 571-272-6215. The examiner can normally be reached on Monday – Friday at 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven p. Griffin, can be reached on (571) 272-1189. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

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/S. M. M./

Examiner, Art Unit 1791

/Steven P. Griffin/

Supervisory Patent Examiner, Art Unit 1791